appeared from time to time in the Report and Bulletin of the United States Fish Commission, and upon the Hand-books, &c., to the International Fisheries Exhibition. These, with Grenville Murray's "The Oyster, Where, How, When," &c. (1861 and 1863), Williams's "Silvershell; or the Adventures of an Oyster" (1856), and Eyton's "History of the Oyster" (1858), are the chief part of his stock-in-trade; to which may be added newspaper articles, reviews, extracts from popular natural histories, &c. Besides these "authorities," some fifty pages, largely taken from Gwyn Jeffreys's "Conchology," deal with Brachiopoda (!), Anomiadæ, Pectinidæ, and Ostreidæ; under the latter family there is an account of *Ostrea edulis*, but none of *Ostrea* (*Gryphœa*) *angulata* and *virginica*, although the book does not profess to be confined to the former species; and about 212 pages are occupied by reprints of Parliamentary papers of various sorts.

The only chapter in which we are at one with Mr. Philpots is that in which an appeal is made to the Government to take the "oyster question" seriously in hand, though even here we cannot but regret the tone in which he speaks of the Board of Trade. Unhappily, however, there is no denying the fact that the inspectors sent by the Board to report on oyster fisheries have often been unfit for their task, and have, sometimes at any rate, been freely fooled by interested parties, for want of a little practical acquaintance with their subject. This has been pointed out again and again, not only as regards oyster fisheries, but also in connection with other fishery questions; but it cannot be pointed out too often. A point to which Mr. Philpots should have drawn public attention is that, if the proposition to move the London drainage outfall to Foulness take effect, the best of the few remaining grounds for breeding the almost extinct "native" (*sensu stricto*) will in all probability be ruined.

A book of a different calibre is that of Prof. Brooks. It is avowedly merely an attempt to rouse the State of Maryland to take such measures with regard to the oyster-fisheries as can alone prevent their ruin, measures such as some other States have already taken with marked success. It is hardly necessary to say of Prof. Brooks that his little book is a clear and accurate summary of what is known about the American species, for few men can speak with more authority on the subject. We can only hope that the Legislature to which he appeals may be more far-sighted than our own. Had the restrictions which he advocates been laid on our English public beds fifty years ago, the rare "native" might be almost as cheap now as in those almost forgotten days when the market was not yet flooded with French and Dutch produce posing as the genuine article, and oyster grottos were a familiar feature of the streets.

THE DESTRUCTION OF MOSQUITOES.

Dragon-flies v. Mosquitoes. (New York: D. Appleton and Company, 1890.)

The book before us consists of three prize essays written in response to a circular issued in 1889 to "The Working Entomologists of the Country," offering certain prizes for essays containing original investigations on methods for destroying the mosquito and the house-fly.

The prizes were offered by Mr. R. H. Lamborn, whose position as Director of the Lake Superior and Mississippi Railway had caused him to spend a considerable time encamped in the swampy forests which surround the head of the great lake. Here he came into contact with mosquitoes of the most irritating kind, and here he made the interesting observations on their destruction by dragon-flies which stimulated him to offer the above-mentioned prizes. The lines laid down in the circular as to the direction which the investigations should follow have reference chiefly to the destruction of these insect pests by dragon-flies. The competitors were also required to examine which species of Odonata are best adapted for the purpose, to investigate their habits, and the possible methods of breeding them in large numbers. But although this line of inquiry is suggested, the practical object of the investigation is to determine whether it is possible to diminish or extinguish the noxious Diptera, and if so, by what means.

The essay which gained the first prize is by Mrs. C. B. Aaron, who gives a careful account of the habits and life-history of both the Diptera in question, and of the Odonata, and then considers the advisability and the means of exterminating the former. The gravest charge which is adduced against these Diptera, apart from the irritation they cause, is that they act as carriers of such parasites as Filaria, and possibly of some species of Tænia, whilst they undoubtedly serve to disseminate Bacteria associated with certain infectious diseases. In their favour it may, however, be said that they act as very efficient scavengers, especially during the larval period of their life-history; and it is a very open question whether the world would be much benefited by the total extinction of the two genera Culex and Musca. Without attempting to decide this point, Mrs. Aaron proceeds to consider the possibility and the cost of attempting their extermination.

The plan of pitting the dragon-fly against the gnat—a plan similar to that which Prof. Riley has brought to such a successful termination by encouraging the destruction of the orange scale, *Icerya purchasi*, by means of a small beetle, the *Vedalia cardinalis*, imported from Australia—is dismissed in a few words, for reasons which are considered at greater length in the following essays; but several mechanical means are suggested, the most promising and cheapest of which, in the case of the mosquito, is to spray with crude petroleum all collections of stagnant water which cannot be easily drained. The oil forms a thin film on the surface of the water, and effectually clogs the aperture of the breathing tubes as soon as the larvæ come to the surface, as they must do, for air.

The authors of the two remaining essays, Mr. Weeks and Mr. Beutenmuller, divide the second and third prizes. The former commences his essay with a valuable table, giving details of the time of appearance, of the comparative voracity, and of the habitat of sixteen species of dragon-fly found in the neighbourhood of New York. From these, three are selected—*Anax junius*, and *Æschna constricta* and *heros*—as the most likely to prove destroyers of mosquitoes. When, however, the life-histories of the opposed insects are compared, it becomes at once evident that we must not trust to the Odonata to rid us of

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the biting Culicidæ. The breeding and artificial rearing of dragon-flies present almost insuperable difficulties, for, when the larval stage is attained, each individual would have to be isolated, because they are apt to devour each other when confined in a limited space. Irrespective of the question of breeding, an insect which produces but one brood a year, and lives but a few days in the imago condition, has little chance of seriously affecting a race whose numerous annual generations succumb only to the severest weather. In its natural condition the dragon-fly does not correspond sufficiently closely with the mosquito, either in time or space, to give it any real chance of effecting the destruction of the latter; its breeding-places are also more restricted, as it requires a volume of water which is constant for some little time, whereas the mosquito, with its quicker metamorphosis, can make use of any temporary puddle.

The conclusion to be drawn from all three essays is, that if a serious attempt is to be made to combat these most annoying insects, the means to be adopted with most chance of success lie rather in the direction of draining swamps, raising fish, and encouraging water-fowl in the infested ponds, and, where it would not be injurious, using crude oil, than in any efforts to increase the supply of dragon-flies.

Mrs. Aaron and Mr. Beutenmuller have appended to their essays useful lists of papers on the subject of their work; and the latter has added a preliminary list of the Odonata in the State of New York, and a very useful catalogue of the "described transformations of the Odonata of the world." The book is illustrated with several plates, which depict stages in the life-history of the insects in question, and various mechanical devices for attracting mosquitoes, by means of lamps, to an oily grave; and for spraying with petroleum the water in which they breed.

A. E. S.

OUR BOOK SHELF.

Materials for a Flora of the Malayan Peninsula. No. 3. By George King, M.D., F.R.S., &c. Reprinted from the Journal of the Asiatic Society of Bengal, Vol. LX. Part 2.

Dr. King's third contribution towards a flora of the Malayan Peninsula contains the *Malvales*, and comprises almost as large a proportion of new species as the two preceding parts, but no new genus. The Malvaceæ number twenty-four species belonging to eleven genera; the Sterculiaceæ, forty-eight species belonging to twelve genera; and the Tiliaceæ, fifty-eight species belonging to nine genera. Although 25 per cent. of the species are new, there are only three of the first natural order and five of the second; the rest belong to the Tiliaceæ, of which nearly half are new. Nine out of ten species of *Pentace* were previously undescribed, and only two others are known. There are seven additional species of the characteristic genus *Elæocarpus*, out of a total of twenty-three. This is the largest number of any one genus, though *Sterculia* comes next with twenty-two species. It will be perceived that the new species are almost exclusively trees. The flora of Malacca and Cochin-china is exceedingly rich in the arboreous element; the number of new species described by Dr. King in his various monographs and by Dr. Pierre in his "Flore Forestière de la Cochinchine" being something enormous.

W. B. H.

Zoological Wall Pictures. Three Diagrams, each 32 inches by 42 inches. (London: S.P.C.K.)

The Animals of the World, arranged according to their Geographical Distribution. Third Edition, Revised and Re-drawn. Size, 58 inches square. (London: Moffatt and Paige.)

The first named depict (1) fishes, as represented by the cod, eel, and herring; (2) chelonians, as exemplified by the common water tortoise and the Greek land tortoise, together with drawings of parts of the chelonian skeleton; (3) insect pests, in the *personæ* of the Pine Bark and Colorado beetles, the larvæ of which are delineated. The diagrams are both bold and accurate, and good of their class.

The second named embodies an attempt to represent the distribution of the animals selected in latitudinal series. The plan, although a good one, is manifestly insufficient, inasmuch as by its means no provision can be made for overlap. However, for a bold wall diagram, the picture may be recommended. Its meaning is at once obvious; and a fact such as the occurrence of seals and whales at extreme latitudes, which at once arrests the attention, is sufficient in itself to arouse the spirit of inquiry in any active mind. In future editions the word "Some" might with advantage be substituted for the article "The" which heads the title.

Crozet's Voyage to Tasmania, New Zealand, the Ladrone Islands, and the Philippines, in the Years 1771–72. Translated by H. Ling Roth. Illustrated. (London: Truslove and Shirley, 1891.)

In 1769 a Tahitian was brought to Europe by Bougainville as "a human curiosity." Afterwards he was sent to the Mauritius, the Governor of which was instructed to forward him to his destination. The task of restoring him to his native land was undertaken by Marion du Fresne, who was then a well-to-do resident in the Île de France; and thus originated the expedition the story of which is recorded in the present volume. The party started in two vessels, and Marion proposed, in the course of the voyage, to do much exploring work—a kind of enterprise for which he seems to have been well fitted, as he had been a distinguished officer of the French navy. Unhappily, some members of the expedition, including Marion himself, were massacred by the Maories. The voyage, however, was continued, and in 1783 an account of it was published which had been compiled and edited by the Abbé Rochon, the well-known traveller, from the log of M. Crozet, who, after Marion's death, commanded one of his two ships. It is this account which Mr. Ling Roth has translated. The work will be read with interest by students of the history of geographical discovery, and a good many of M. Crozet's statements about savage life have considerable value from the point of view of the ethnographer and the anthropologist. A preface, and a brief reference to the literature of New Zealand, are contributed by Mr. J. R. Boosé, Librarian of the Colonial Institute; and the volume contains, besides maps, very good illustrations of some works of Maori art.

Livingstone and the Exploration of Central Africa. By H. H. Johnston, C.B., F.R.G.S., &c. (London: G. Philip and Son, 1891.)

This volume ranks with the best of the series to which it belongs—"The World's Great Explorers and Explorations." Mr. Johnston realizes fully the splendour of Livingstone's achievements, and has succeeded admirably in bringing out their significance in the history of African exploration. He begins with two excellent general chapters dealing with the "natural history" and the "human history" of Central Africa; and afterwards he gives vivid accounts of all the various regions traversed by his hero. Thus the reader is enabled to form his own opinion as to the value

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